

### **Abstract of the Disclosure**

An automotive lambda oxygen sensor is formed by electroless plating of a thin, catalytically active, conductive electrode uniformly on the outer surface of a zirconia thimble. The process includes forming a pristine zirconia solid electrolyte  
5 thimble and drilling out a cylindrical cavity in it. A porous outer surface suitable for producing crystallization sites is formed by dipping the unfired thimble in a zirconia slurry containing spray-dried microspheres and firing the coated thimble to densify the thimble and the microspheres and to produce cavities on the surface of the thimble. An inner platinum electrode is formed by conventional  
10 conductive ink painting on the axial cavity of the sensor, and the sensor is again fired. The surface is activated by immersion in an acetone chloroplatinic acid bath to form multiple crystallization points, heat treated, then plated in an electroless platinum bath to a desired thickness. After plating, the sensor is heat treated and a conventional spinel glaze coat is flame sprayed over the sensor. The process  
15 produces sensors which consistently provide rapid response times and stable operation.